



Atty. Docket No. BIG07 P-301

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit : 3643
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Appln. No. : 10/500,078
Filing Date : June 23, 2004
Confirmation No. : 5861
For : DEVICE FOR FEEDING POULTRY ESPECIALLY
FATTENED POULTRY, PREFERABLY BROILERS

Commissioner for Patents
P.O. Box 1450
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Dear Sir:

CLAIM OF PRIORITY

Applicant hereby claims the priority benefits under the provisions of 35 U.S.C. §119, basing said claim of priority on German patent application Serial No. 101 64 122.2, filed December 24, 2001.

In accordance with the provisions of 35 U.S.C. §119 and 37 CFR §1.55(a), certified copy of the above listed German patent application is enclosed.

Respectfully submitted,

6/6/06
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Priority Certification in respect of the submission of a Patent Application

File Reference: 101 64 122.2

Date of application: 24 December 2001

Applicant/Proprietor: Big Dutchman International GmbH,
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Title: Device for feeding poultry, in particular
poultry for fattening, preferably broilers

IPC: A 01 K 39/012

**The appended items are a true and accurate reproduction of the
original documents of this Patent Application.**

Munich, 30 January 2003
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A 9161

DEVICE FOR FEEDING POULTRY, IN PARTICULAR POULTRY FOR
FATTENING, PREFERABLY BROILERS

DESCRIPTION

The invention relates to a device for feeding free-range poultry, in particular poultry for fattening, preferably broilers, kept in a shed, with at least one feed conveyor pipe held above the floor of the shed and capable of being raised and lowered and which has a series of branch apertures, of which each is associated with a pan device suspended on the conveyor pipe and which comprises a drop tube branching off from the branch aperture and a feeder pan located beneath the drop tube with a dome-shaped structure formed by grid bars extending in a spoke-like manner, the drop tube consisting of an inner cylinder branching off from the branch aperture and an outer cylinder surrounding the inner cylinder and on which the feeder pan is suspended by means of the grid bars of its dome-shaped structure, such that it comes to rest when the feed conveyor pipe is lowered, coming to rest in particular on the floor of the shed, the outer cylinder being rotatably guided on the inner cylinder in a raisable and lowerable manner and at least one lifting stop defining the raising and lowering path being provided.

A device of the aforementioned generic type is disclosed in EP 0 105 571 B1.

Further apertures are opened up in the drop tube when the feeder pan of the known device comes to rest with the lowering of the conveyor pipe. As a result, depending on the respective position of the apertures relative to the feeder pan, various discharge cones and discharge heights may be assigned to the feed passing via the drop tube into the feeder pan. In order to provide, for example chicks, with improved eating conditions, a higher discharge height

and therefore a higher feed level in the pan is necessary which is achieved with the known device by opening up further apertures in the drop tube. Depending on the growth of the chicks, the feed level in the pan may, however, also be set lower, as animals which are growing and therefore ultimately becoming larger, are able to reach regions located lower in the feeder pan more easily than chicks for the purpose of acquiring feed.

Devices installed in a shed are intended to be as free from maintenance as possible. Accordingly, it is desirable to refill the feed in the most uniform manner possible, whilst still remaining free of interruption, with predetermined metering respectively into each individual feeder pan. With the known device, however, interruptions may arise as the feed emerges irregularly from the drop tube into the feeder pan, for example because corresponding outlet apertures may become clogged in the casing surface of the drop tube. This is the case, in particular, with feed which is prone to form bridges, for example with feed with poor flow behaviour.

Moreover, the outer tube may rotate relative to the inner tube, whereby the cross-section of an additional outlet aperture in the drop tube is reduced because, during rotation, an aperture in the outer cylinder is no longer congruent or only partially congruent with the associated aperture in the inner cylinder.

Feeder pans should be cleaned at regular intervals. This is effected by spraying with water, generally after a fattening period, before the shed is occupied by new chicks. During the spraying process, it is advantageous for the feeder pan to be capable of rotation about the longitudinal axis of the drop tube branching off from the feed pipe, because in this situation practically all inner areas of the feeder pan run past a sharp water jet directed

from one side into the feeder pan. While the possibility of the feeder pan rotating on the inner cylinder of the drop tube is still advantageous for cleaning, it is nevertheless disadvantageous, for the aforementioned reasons, for keeping the additional apertures in the drop tube open. A further disadvantage of the free rotatability of the feeder pan lies in the fact that a predetermined distance between the feeder pan and the free end of the drop tube, on which the respective desired feed level in the feeder pan is dependent, may be unintentionally altered due to the rotational movement during cleaning.

The object of the invention is to avoid these disadvantages with a device for feeding poultry, as has been disclosed above.

This object is achieved by the features of claim 1. Advantageous developments and embodiments are revealed from the features of claims 2 to 19.

With the device according to the invention, both the outer cylinder and the inner cylinder respectively consist of adjacent cylinder sections coaxial to one another, front edge regions of the cylinder sections, facing one another, being connected to one another by bridging elements which bridge a gap region which corresponds to the distance between the cylinder sections.

It has been shown that, during a fattening period, with an initial feed level for chicks and another feed level for broilers, therefore ultimately with only two feeding station positions in the feeder pan, adequate fattening results may be achieved, so that with a subdivision of the inner cylinder and the outer cylinder into two respective cylinder sections, a simple design is provided which has sufficient operational reliability.

The gap region between two cylinder sections of the inner cylinder and/or the outer cylinder forms an additional aperture for the emergence of feed into the feeder pan, also provided here as a so-called "360° window" which is adjacent to the lower free end of the drop tube formed from the inner cylinder and outer cylinder. Each gap region between the cylinder sections forms a free circumferential aperture, which is only interrupted by the bridging elements. These, however, without any losses in strength or stability needing to be taken into account, may be kept so thin in their plane located in the outflow direction of the feed that their thickness and therefore their cross-section reduces the free aperture width of the 360° window formed in a virtually imperceptible manner. Even with unfavourable circumstances, it is therefore possible to arrive at a situation with hardly any bridge formations or blockages in the region, which is present as the 360° circumferential window, of the additional apertures in the casing of the drop tube and/or its cylinder.

On the actuation of the conveyor device installed in the feed conveyor pipe, for example a drag chain conveyor or a spiral conveyor, it is guaranteed with the device designed according to the invention that each feeder pan is also reliably filled up to the predetermined feed level. There will rarely be any risk of individual feeder pans remaining empty, in particular in the critical initial stage of the fattening period for chicks which are still small, due to blockages in the region of the additional apertures in the drop tube.

The feed conveyor pipe, usually extending vertically and therefore parallel to the floor of the shed, may be moved perpendicularly, for example by means of traction cables capable of being centrally actuated. With the known device, this actuation makes it possible for the feeder pan to be brought into positions in which it either rests on the

floor of the shed or is raised therefrom. In the same manner as with the known device, with the device according to the invention, the placing of the feeder pan on the floor of the shed is also used to displace the outer cylinder vertically to the inner cylinder, and by means of this displacement travel, to open an additional feed discharge aperture, namely the 360° circumferential window in the drop tube. With this operation, comparable to the prior art, it is achieved with the device according to the invention in a further embodiment, however, that the end-face cylinder section covers the gap region between the cylinder sections of the outer cylinder, when the outer cylinder is moved by raising the feed conveyor pipe into a position which is lowered relative to the inner cylinder, in which the lifting stops of the inner and outer cylinder are in mutual contact. It can be seen that the formation of the 360° window has the advantage that, even in the position where it has come to rest, in which the window is opened up, a rotation of the feeder pan which may arise relative to the inner cylinder of the drop tube has no disadvantageous effect on the feed outflow through the 360° window.

In order to prevent the outer pipe and the feeder pan falling away from the inner cylinder when the feed conveyor pipe is raised, at least one lifting stop is provided. With the device according to the invention, a recess in the inner surface of the cylinder participates in the formation of the lifting stop of the outer cylinder as well as at least one abutment shoulder for the recess, projecting radially from the inner cylinder. If the inner cylinder is raised, by the feed conveyor pipe being moved to a greater distance from the floor of the shed, the inner cylinder initially slides in the outer cylinder until the abutment shoulder projecting from the inner cylinder, bears against the step formed by the recess in the outer cylinder, so that when the inner cylinder is raised further, the outer

cylinder and therefore the feeder pan connected thereto may be drawn along together. In this position, therefore, the parts of the inner cylinder and the outer cylinder participating in the formation of lifting stops are in mutual contact and the end-face cylinder section of the inner cylinder covers the gap region between the cylinder sections of the outer cylinder. The additional aperture in the feed drop tube, the "360° window", is closed.

Each abutment shoulder for the recess may be a projection arranged at random on the inner cylinder. Preferably, each abutment shoulder for the recess is part of a radial projection of the inner cylinder, in the manner of a collar flange.

So that the bridging elements, which connect the cylinder sections, do not substantially reduce the free opening surface of the "360° window", i.e. only by an insignificant amount and in order to connect the cylinder sections to one another in an adequately stable and secure manner, however, a special design and cross-sectional shape has been selected for the bridging elements. Each bridging element is a flat web, of which the web surface plane extends radially to the axis of the respective inner and/or outer cylinder. The number of flat webs may be varied. Four flat webs for the inner cylinder and seven flat webs for the outer cylinder have proved satisfactory. Particularly advantageously, the bridging elements of the outer cylinder which are present as flat webs have the shape of paddles and/or vanes projecting radially over the periphery of the outer cylinder into the feeder pan. The vanes on the outer cylinder control and maintain the uniform feed distribution into the feed plate, even if the entire feeder pan should swing or move in pendulum fashion about the conveyor pipe and said vanes prevent, moreover, the excessive scratching and pecking of the animals in the feed and therefore the resulting feed losses.

It is intended that the feed is discharged and distributed as uniformly as possible from the drop tube. In this connection, an overflow of the feed from the feeder pan due to an excessively high feed level is to be avoided as is too low a feed level, which impedes the feeding of the animals. For the correct metering of the feed into the pan, it is important, as already mentioned, that a predetermined distribution cone is formed and, in particular, maintained in the feeder pan, the distribution cone, in turn, able to be influenced by the distance between the feed outlet apertures present in the drop tube and the feeder pan. The distance between the feeder pan and the lower free end of the drop tube and/or the "360° window" therefore has a substantial influence on the feed level in the pan and thus it depends on the feed level, in turn, whether the feed consumption by the animals takes place in optimum fashion. The possibility of altering and/or adjusting the distance between the feeder pan and the lower free end and/or between the feeder pan and the "360° window" of the drop tube is advantageous, and with the device according to the invention, it is achieved in terms of design that the outer surface of an upper cylinder section of the outer cylinder is configured as a threaded spindle and that the free ends of the grid bars of the dome-shaped structure are connected to a screw ring which is screwed onto the region of the outer cylinder configured as a threaded spindle.

The pitch of the threaded spindle is preferably selected to be such that even with relatively small rotation and/or angular movement of the feeder pan, a perceptible change is noticeable in the distance between the feeder pan and the feed conveyor pipe, from which the drop tube with its apertures branches off.

As disclosed above, the feeder pans begin to rotate about a vertical axis during cleaning by a water jet. This rotation is even desirable. The rotary movement does have the

disadvantage, however, that the feed level which has been set may, as a result, be unintentionally changed. After cleaning, therefore, all the feeder pans in the feed line in a shed would have to be readjusted, which involves a considerable amount of work.

The undesirable automatic alteration and/or rotation of the feeder pans is prevented with the device according to the invention in that it comprises at least one rotary stop preventing or at least defining the rotational path of the outer cylinder relative to the inner cylinder.

In this connection, the configuration and arrangement are such that each rotary stop comprises at least one raised portion arranged in a predetermined region of the outer surface of the inner cylinder, and at least one drive element and/or projection located on the inner surface of the outer cylinder, into the rotational path of which, followed during the rotation of the outer cylinder about the inner cylinder, the raised portion projects. If the feeder pan rotates, and therefore the outer cylinder on which the feeder pan is suspended, relative to the inner cylinder, the projection strikes against the raised portion, at the latest after a predetermined rotational path has been covered, and prevents it from rotating back again.

In a particularly advantageous manner, the predetermined region of the outer surface of the inner cylinder, which is provided with the raised portion for the rotary stop, is its upper head part which is offset relative to the remaining portion of the inner cylinder as a result of reduced cylinder diameter. The feeder pan and/or its outer cylinder may therefore only rotate freely about the inner cylinder in the position in which it is suspended on the inner cylinder above the lifting stops between the outer and inner cylinders. In the upper position, i.e. in a

lowered position of the feed conveyor pipe and therefore also of the inner cylinder, in which the feeder pan comes to rest and as a result its outer cylinder is raised relative to the inner cylinder, the projection is, by contrast, in the effective area of the raised portion located on the upper head part of the inner cylinder, which raised portion projects into the rotational path of the projection on the outer cylinder. The outer cylinder and therefore the feeder pan are therefore only capable of rotation in the upper position until the rotational movement is stopped by the rotary stop.

The device according to the invention is also characterised by the fact that the automatic, uncontrolled and therefore undesirable rotation of the screw ring relative to the outer cylinder, which would therefore result in an alteration of the feed level in the feeder pan, is prevented by the outer cylinder comprising, in its region configured as a threaded spindle, at least one spring-elastic engagement cam, preferably spring-elastic in a radial direction, which may engage positively with cut-outs which the screw ring comprises on its inner circumferential surface.

With the device according to the invention, it is of particular inventive significance that the rotary stop, in conjunction with the regions of the inner cylinder which are offset relative to the diameter, serves the purpose of blocking the specified setting of the feed level, if required, against unintentional actuation, by means of the engagement cams in the suspended position or, if required, releasing the specified setting of the feed level in the raised position of the pan. This is achieved by the engagement cams and the cut-outs being provided with leading flanks aligned obliquely to the rotational movement about the vertical axis.

Because the engagement cams and the cut-outs are provided with leading flanks aligned obliquely to the rotational movement, the spring-elastic engagement cams are deflected with the appropriate application of force during rotation and in a similar manner to a cam drive are deflected out of the cut-outs. After the deflection of the engagement cams from the cut-outs, the screw ring may be further rotated on the thread of the outer cylinder, the feeding station position defining the feed level changing, as described above. As soon as the engagement cams have reached an adjacent cut-out they engage again in this cut-out, or the screw ring, by repeating the deflection movement, may be rotated further.

This is only possible, however, and particularly advantageously, in the upper position of the outer cylinder relative to the inner cylinder because, due to the offset outer surface of the inner cylinder with the reduced cylinder diameter, there is sufficient room behind the engagement cams into which they may be moved during rotation and when raised out of the cut-outs. In the lower suspended position, the outer surface of the inner cylinder is supported from behind against the engagement cams, due to its enlarged outer diameter at that point, so that it is not possible to release the feeding station positions which have been set and/or lift out from the cut-outs, even with the greatest exertion of force.

As, during cleaning, the entire feed line is raised with the feed pipe, and as a consequence, only the suspended position of the outer cylinder is provided, in this suspended position of the outer cylinder it is automatically guaranteed that the previously set feeding station positions will be locked in place and unintentional alteration of the feeding station positions is therefore not possible. The feeder pan may, however, be rotated freely on the inner cylinder in the suspended position of

the outer cylinder for the purpose of carrying out cleaning.

Only in the raised position of the feeder pan and of the external cylinder connected thereto is it possible to alter the feeding station positions by the rotation of the screw ring on the threaded spindle part of the outer cylinder, because only in this position can the engagement cams be deflected out of the cut-outs of the screw ring with the aid of the rotary stops, acting in the manner of a drive element.

To alter the feeding station position which has been set, therefore, the unit consisting of the feeder pan, dome-shaped structure and outer cylinder first has to be raised. This unit may then be rotated about the vertical axis in the direction of rotation of the desired alteration to the feeding station, until drive elements on the outer cylinder in the form of projections have reached the raised portions on the inner cylinder and the outer cylinder is secured against further rotation. With the continuation of the rotational movement, with increasing exertion of force, the engagement cams release the feeding station positions, in order to be able to engage again in the next feeding station position, according to a predetermined path of rotation.

In a development of the device according to the invention, the feature that the feeder pan comprises a feed plate, which in the region of its plate edge comprises connecting elements for connecting to the dome-shaped structure serves to improve the cleaning effect and facilitate cleaning. The connecting elements may comprise a folding joint and at least one locking and/or retaining element. Instead of a connection with the dome-shape structure, the feed plate may also be formed in the region of its plate edge from two plate edge sections, one of which is connected to the grid

bars of the dome-shaped structure, and which are connected to one another by means of at least one folding joint and at least one locking and/or retaining element, for example clamps. Of particular advantage is an unhookable folding joint, so that a feed plate may be replaced if necessary.

The feed plate is designed to be conical in the centre so that feed falling into the feed plate from the unit of the inner cylinder and outer cylinder forming the drop tube may slide outwards.

To improve feed consumption by the animals, an annular surface of the feed plate, which extends around the centre of the plate located beneath the drop tube, is subdivided into feeding sections. Each feeding section consists of at least one section, compartment, or the like by way of a shaped area delimited by a depression and/or raised portion.

Particularly advantageously, the number of feeding sections is equal to a multiple of the number of the bridging elements of the outer cylinder configured as paddles and/or vanes.

If, for example, seven cut-outs are distributed over the inner circumference of the screw ring, then seven feeding station positions are determined thereby which may be adjusted by the rotation of the screw ring relative to the outer cylinder. The outer cylinder itself comprises in its threaded region at least one, preferably two, engagement cams, which are located on the circumference of the outer cylinder such that they may engage simultaneously in respectively associated cut-outs of the screw ring. With seven possible feeding station positions, it is expedient to arrange seven bridging elements on the circumference of the outer cylinder and to configure said bridging elements as paddles or vanes, so that they control and maintain the

uniform distribution of the feed into the feed plate. In the case of the feed plate subdivided into 14 sections, two respective compartments or sections of the feed plate are located between two bridging elements of the outer cylinder present in the form of vanes or paddles, so that on the one hand it is easy for the animals to take the feed and, on the other hand, it is rendered more difficult for the animals to scatter feed sideways out of the feeder pan. Because of the chosen seven feeding station positions in the threaded connection between the outer cylinder and screw ring and because of the hinge connection between the feed plate and dome-shaped structure, the seven paddles and/or vanes may be made to coincide exactly with the compartments or sections of the feed plate.

An embodiment of the invention from which further inventive features are derived is shown in the drawings, in which:

Figure 1 is a view of the pan device, suspended on the feed conveyor pipe, of a device for the feeding of broilers,

Figure 2 is a view of an outer cylinder,

Figure 3 is a side view of the outer cylinder according to Figure 2 in half section,

Figure 4 is a view of the inner cylinder with upper pipe adapter for securing to the feed conveyor pipe without a closing upper part,

Figure 5 is a side view of the inner cylinder in half section,

Figure 6 is a side view of the device according to Figure 1 in half section with the feed conveyor pipe raised, so that the feeder pan

is suspended freely above the floor of a shed,

Figure 7 is the unit formed from the inner cylinder and the outer cylinder guided thereon of a drop tube in a sectional view along the line VII-VII in Figure 6,

Figure 8 is a side view of the device with the feed conveyor pipe lowered, so that the feeder pan is resting on the floor of the shed,

Figure 9 is a section through the drop tube of the device according to Figure 8, formed from the inner cylinder and outer cylinder, in a section along the line IX-IX in Figure 8,

Figure 10 is a view of a feeder pan, in which the dome-shaped structure has been omitted for the purpose of clarification of the feed plate.

The device for feeding free-range poultry for fattening, in particular broilers, kept in a shed, consists of at least one feed conveyor pipe 1 held above the floor of the shed and capable of being raised and lowered, which extends along the entire length of the shed and, by means of a spiral conveyor located therein, or a cable or chain with conveyor disks, transports feed capable of scatter distribution to individual pan devices 2 suspended on the feed conveyor pipe 1. The aforementioned parts may also be designated in their entirety as the feed line.

In Figure 1 only one part of the feed conveyor pipe 1 is shown, with a pan device 2 suspended in the region of a branch aperture in the feed conveyor pipe 1. The pan device 2 comprises a drop tube 3 branching off from a branch

aperture, not further visible here, and a feeder pan 4 located beneath the drop tube 3 with a dome-shaped structure 6 formed by grid bars 5 extending in a spoke-like manner. In this connection, the drop tube 3 consists of an inner cylinder 7 branching off from the branch aperture, not visible here, and an outer cylinder 8, surrounding the inner cylinder 7, on which the pan 4 is suspended by means of the grid bars 5 of its dome-shaped structure 6, such that it comes to rest when the feed conveyor pipe 1 is lowered, coming to rest in particular on the floor 34 of the shed, not shown further here. The outer cylinder 8 is rotatably guided on the inner cylinder 7 in a raisable and lowerable manner, at least one lifting stop being provided defining the raising and lowering path and which are described in greater detail hereinafter.

Figure 2 shows a view of the outer cylinder 8.

In Figure 3 a side view of the outer cylinder 8 according to Figure 2 is shown, in half section.

Figures 2 and 3 are explained in greater detail hereinafter.

The outer cylinder 8 consists of adjacent cylinder sections 8' and 8", coaxial to one another. The cylinder sections 8' and 8" are connected to one another by means of bridging elements 9, each of which is configured as a paddle or vane 10 projecting over the periphery of the outer cylinder 8 into the feeder pan 4. The bridging elements 9 bridge the gap region 11 which corresponds to the distance between the cylinder sections 8' and 8" of the outer cylinder 8. The cylinder inner surface 12 of the outer cylinder 8 and/or in this case its upper cylinder section 8', comprises a recess 13 which is part of a lifting stop 14. The outer surface of the upper cylinder section 8' of the outer cylinder 8 is

configured in the upper end region as a threaded spindle 15 which has screw threads 16.

The outer cylinder is made of suitable plastics material such that the screw threads 16 and therefore the threaded spindle 15 may be easily shaped during the manufacture of the outer cylinder 8.

As Figure 1 also shows, the free ends of the grid bars 5 of the dome-shaped structure 6 are connected to a screw ring 17 which may be screwed onto the region configured as a threaded spindle 15 of the cylinder section 8' of the outer cylinder 8.

During rotation of the feeder pan 4 relative to the outer cylinder 8, the threaded spindle 15 causes the height of the feeder pan 4 to be altered relative to the lower end of the cylinder section 8" with the vanes 10 of the outer cylinder 8.

It may be seen, moreover, from Figures 2 and 3 that a rotary stop defining the rotational path of the outer cylinder 8 relative to the inner cylinder 7 comprises a drive element 19, located in this case on the inner surface 18 of the outer cylinder 8, into the rotational path of which, followed during the rotation of the outer cylinder 8 about the inner cylinder 7, the raised portion 21 arranged on the outer surface 20 of the inner cylinder 7 projects.

Figure 4 shows a view of the inner cylinder 7 which consists of cylinder sections 7' and 7", the open gap region between the cylinder sections 7' and 7" being again bridged by bridging elements 23 in flat web form. In Figure 4 the part of the lifting stop 14 which is configured on the inner cylinder 7 as at least one abutment shoulder 24, projecting radially from the inner cylinder 7, for the recess 13 in the outer cylinder 8 is visible.

Figure 4 indicates that each abutment shoulder 24 for the recess 13 is part of a radial projection 25 of the inner cylinder 7 in the manner of a collar flange. It can further be seen in Figure 4 that the outer surface 20 of the inner cylinder 7 in the upper region and therefore in the region of its head part, is offset relative to the remaining portion of the cylinder section 7' of the inner cylinder 7, as a result of reduced cylinder diameter. The offset step is designated by 26.

It can further be seen in Figure 2 that, to secure the structural unit consisting of the screw ring 17 (Figure 1) with the dome-shaped structure 6 and the feeder pan 4 against rotation, two spring-elastic engagement cams 27 are provided on each outer cylinder 8 in its region configured as a threaded spindle 15. Each engagement cam 27 is connected by means of a spring-elastic tongue 28 to the outer cylinder 8. In this connection, the configuration is such that the tongues 28 are wall portions of the outer cylinder formed by notches and which are capable of springing from the outside inwards under radial pressure and which may be moved back elastically into the initial position when the pressure is released. In the pressureless initial position, the tongues 28 are again flush with the wall of the outer cylinder 8.

Figure 5 shows a side view of the inner cylinder, the right half of the inner cylinder being shown in longitudinal section.

The same components are designated with the same reference numerals.

It can be seen, in particular, in Figure 4 that the inner cylinder 7 at its upper free end participates in the formation of a pipe adapter, by a half shell 29 of the pipe adapter being formed on the inner cylinder 7. This half

shell may be supplemented to form the pipe adapter by the addition of an upper part 30 which is visible in Figure 1 and which surrounds the feed pipe 1 in the region of a branch aperture not shown in more detail, such that the branch aperture is flush with the drop aperture 31 in the upper shell part 29 of the inner cylinder 7. Feed emerging from the feed conveyor pipe passes over the branch aperture and the drop aperture 31 into the inner cylinder and may fall into the feeder pan via the gap region 22 or the lower drop aperture 32. The lower drop aperture 32 is bounded by the lower edges 33 of the cylinder section 7".

Figure 6 shows in a side view a pan device 2 suspended on a feed conveyor pipe 1, the right-hand side being shown in section. The same components are designated with the same reference numerals.

It can be seen from Figure 6 that the inner cylinder 7 is configured such that its end-face cylinder section 7" covers the gap region 11 between the cylinder sections 8 and 8" of the outer cylinder 8, when the outer cylinder 8 is moved by raising the feed conveyor pipe 1 into a position which is lowered relative to the inner cylinder 7 and in which the parts forming the lifting stop 14 are in mutual contact. With this embodiment, it can be seen in Figure 6 that the outer cylinder 8 with the step surface formed by its recess 13 in the cylinder section 8' rests against the abutment shoulder 24 of the radial projection 25 of the inner cylinder 7. Feed material entering the inner cylinder 7 from the feed conveyor pipe is shown here by dots and flows into the feeder pan 4, flowing out of the lower drop aperture 32 of the inner cylinder 7 into the cylinder section 8" of the outer cylinder 8 and therefrom directly into the feeder pan 4. The feed covers the conically-shaped floor of the feeder pan 4, likewise made of plastics material, in a flat pile as may be seen here.

Poultry running about on the floor 34 of a shed are able to reach the feed located in the bottom of the feeder pan 4.

The height of the discharge cone of feed above the floor of the feeder pan 4 is adjustable. To regulate the feed level, and/or to adjust the so-called feeding station position, the screw ring 17 to which the grid bars 5 of the dome-shaped structure 6 are connected, is rotated about a vertical axis. Depending on the rotational path and pitch of the screw threads 16 the position of the pan is displaced relative to the lower discharge edge 35 of the lower free end of the outer cylinder section 8".

Figure 7 is a sectional view along the line VII-VII in Figure 6. The same components are designated by the same reference numerals. Figure 7 indicates that the inner cylinder 7, of which the cylinder section 7' is visible here, is surrounded by the outer cylinder 8 and/or by its cylinder section 8', visible here. The outer cylinder in the position shown here is therefore freely rotatable about the inner cylinder 7. The drive elements 19 which are arranged on the inner surface of the outer cylinder 8 may be seen in Figure 7.

The screw ring 17 comprises cut-outs 37 on its inner circumferential surface 36. Engagement cams 27 which are mounted on the spring-elastic tongues 28 may engage with the cut-outs 37 so that the screw ring 17 may not be rotated relative to the outer cylinder 8, when the engagement cams 27 are engaged in the cut-outs 37. Once set, the feed level may be maintained. In the event of rotational forces being exerted on the feeder pan and/or via its dome-shaped structure on the screw ring 17, the unit consisting of the outer cylinder 8, screw ring 17, dome-shaped structure 6 and feeder pan 4 only rotates relative to the inner cylinder 7. The inner cylinder 7 may

not rotate therewith as it is suspended on the feed conveyor pipe 1.

Figure 8 shows a side view according to Figure 6, the right half being again shown in section. The feed conveyor pipe is lowered in the position shown in Figure 8 so that it extends at a shorter distance above the floor 34 of the shed. The feeder pan 4 comes to rest on the floor 34 of the shed in the position shown in Figure 8, as a result of which the unit formed by the outer cylinder with the dome-shaped structure 6 and the feeder pan 4 is raised relative to the inner cylinder 7. In this position, the recess 13 forming the lifting stop 14 and the abutment shoulder 24 of the inner cylinder 7 are no longer in mutual contact. The outer cylinder 8 with its cylinder sections 8' and 8" is therefore raised relative to the inner cylinder to such an extent that the gap region 11 between the cylinder sections 8' and 8" of the outer cylinder 8 is congruent with the gap region 22 between the cylinder sections 7' and 7" of the inner cylinder 7. As a result of the congruent open gap regions 11 and 22 which form a "360° window", the feed may pass into the feeder pan 4, in addition to the lower drop aperture 32, as is shown here by dots. The feed level in the feeder pan 4 is substantially higher, so that even young animals, such as chicks, are able to reach over the edge of the feeder pan 4 to the feed, which now stands higher in the feeder pan 4.

Figure 8 also indicates that the upper region of the cylinder section 8' of the outer cylinder 8, which is provided with screw threads 16 and onto which the screw ring 17 is screwed, are now raised to such an extent that the drive elements 19, not visible here, may be brought into cooperation by means of a raised portion 21 or 21' of the inner cylinder 7.

Figure 9 again shows a section in the plane IX-IX in Figure 8. The same components are designated with the same reference numerals.

It is visible in Figure 9 that the raised portions 21 and 21' on the outer surface 20 of the cylinder section 7' of the inner cylinder 7, may come into contact with the drive elements 19, which project from the inner surface 18 of the cylinder section 8' of the outer cylinder 8. The drive elements 19 of the fixed inner cylinder 7 prevent the further rotation of the outer cylinder 8 beyond the position of the raised portion 21 and 21'. The outer cylinder 8 may therefore only be rotated through 180°, respectively, and further rotation is accordingly stopped by the raised portion 21 and/or 21'. If the outer cylinder is however rotated further, for example in order to alter the feed level with the aid of the thread on the outer cylinder and with the aid of the screw ring 17, the engagement cams 27, due to their oblique flanks 38, are forced out of the cut-outs 37 in the screw ring, said cut-outs also being provided with oblique edges 39. The engagement cams 27 are, in this connection, deflected radially inwards and specifically against the elastic resetting force of the tongues 28. With a corresponding further rotation into the subsequent feed position, which is indicated here by numbers on the screw ring, the engagement cams 27 may engage again in the next cut-out 37, as shown in Figure 7.

Figure 10 shows the view of a pan device of which the dome-shaped structure has been omitted for clarification of the internal design of the feeder pan 4. The same components are designated with the same reference numerals.

Figure 10 indicates, in particular, that the feeder pan 4 comprises a feed plate which, in the region of its plate edge 40, comprises connecting elements 41 and 42 for

connecting to the dome-shaped structure 6, not visible here. The connecting elements 41 and 42 comprise a folding joint 43 and at least one locking and/or retaining element 44. An annular surface of the feed plate, which extends around the plate centre located beneath the drop tube 3 is subdivided into feeding sections, each feeding section consisting of at least one section, compartment or the like by way of a shaped area 45 delimited by a depression and/or raised portion. The number of feeding sections is equal to a multiple of the number of the bridging elements 9 of the outer cylinder 8 configured as paddles and/or vanes 10, of which the cylinder sections 8' and 8" are visible here with the gap region 11 located therebetween.

CLAIMS

1. A device for feeding free-range poultry, in particular poultry for fattening, preferably broilers, kept in a shed, with at least one feed conveyor pipe held above the floor of the shed and capable of being raised and lowered, which has a series of branch apertures of which each is associated with a pan device suspended on the conveyor pipe and which comprises a drop tube branching off from the branch aperture and a feeder pan located beneath the drop tube with a dome-shaped structure formed by grid bars extending in a spoke-like manner, the drop tube consisting of an inner cylinder branching off from the branch aperture and an outer cylinder surrounding the inner cylinder, on which the pan is suspended by means of the grid bars of its dome-shaped structure, such that it comes to rest when the feed conveyor pipe is lowered, coming to rest in particular on the floor of the shed, the outer cylinder being rotatably guided on the inner cylinder in a raisable and lowerable manner and at least one lifting stop being provided defining the raising and lowering path, characterised in that it comprises at least one rotary stop defining a rotational path of the outer cylinder (8) relative to the inner cylinder (7).
2. The device according to claim 1, characterised in that each rotary stop comprises at least one raised portion (21, 21') arranged in a predetermined region of the outer surface (20) of the inner cylinder (7) and at least one drive element (19) located on the inner surface (18) of the outer cylinder (8) into the rotational path of which, followed during the rotation of the outer cylinder (8) about the inner cylinder (7), the raised portion (21, 21') projects.

3. The device according to claim 2, characterised in that the predetermined region of the outer surface (20) of the inner cylinder (7) is its upper head part which is offset relative to the remaining portion of the inner cylinder (7) as a result of reduced cylinder diameter.
4. The device according to any one of the preceding claims, characterised in that the outer surface (20) of an upper cylinder section of the outer cylinder (8) is configured as a threaded spindle (15) and in that the free ends of the grid bars (5) of the dome-shaped structure (6) are connected to a screw ring (17) which is screwed onto the region of the outer cylinder (8) configured as a threaded spindle (15).
5. The device according to any one of claims 1 and 4, characterised in that the outer cylinder (8) comprises at least one spring-elastic engagement cam (27) in a region configured as a threaded spindle (15).
6. The device according to claim 5, characterised in that each engagement cam (27) is configured as a spring-elastic engagement cam (27) in a radial direction.
7. The device according to any one of claims 1 to 6, characterised in that the screw ring (17) of the dome-shaped structure (6) comprises cut-outs (37) on its inner circumferential surface (36) with which the engagement cams (27) may engage positively.
8. The device according to claim 7, characterised in that the engagement cams (27) and the cut-outs (37) comprise leading flanks (38, 39) aligned obliquely to the rotational movement.
9. The device according to any one of claims 1 to 8, characterised in that the outer cylinder (8) and the

inner cylinder (7) respectively consist of adjacent cylinder sections (8', 8", 7', 7"), coaxial to one another, front edge regions of the cylinder sections (8', 8", 7', 7"), facing one another, being connected to one another by bridging elements (9) which bridge a gap region (11, 22) which corresponds to the distance between the cylinder sections (8', 8", 7', 7").

10. The device according to claim 9, characterised in that the inner cylinder (7) is configured such that its end-face cylinder section (7") covers the gap region (11, 22) between the cylinder sections (8', 8") of the outer cylinder (8), when the outer cylinder (8) is moved by raising the feed conveyor pipe (1) into a position which is lowered relative to the inner cylinder (7), in which the lifting stops (14) of the inner cylinder (7) and outer cylinder (8) are in mutual contact.
11. The device according to one of claims 9 and 10, characterised in that the lifting stop (14) consists of a recess (13) of the cylinder inner surface (12) of the outer cylinder (8) and at least one abutment shoulder (24) for the recess (13) projecting radially from the inner cylinder (7).
12. The device according to claim 11, characterised in that each abutment shoulder (24) for the recess (13) is part of a radial projection (25) of the inner cylinder (7) in the manner of a collar flange.
13. The device according to any one of claims 9 to 12, characterised in that each bridging element (9) is a flat web of which the web surface plane is aligned radially to the axis of the respective inner cylinder (7) and/or outer cylinder (8).

14. The device according to claim 13, characterised in that the bridging elements (9) of the outer cylinder (8) which are present as flat webs have the shape of paddles and/or vanes (10) projecting radially over the periphery of the outer cylinder (8) into the feeder pan (4).
15. The device according to any one of the preceding claims, characterised in that the feeder pan (4) comprises a feed plate which in the region of its plate edge (40) comprises connecting elements (41, 42) for connecting to the dome-shaped structure (6).
16. The device according to claim 15, characterised in that the connecting elements (41, 42) comprise a folding joint (43) and at least one locking and/or retaining element (44).
17. The device according to one of claims 15 and 16, characterised in that an annular surface of the feed plate which extends around the plate centre located beneath the drop tube (3), is subdivided into feeding sections.
18. The device according to claim 17, characterised in that each feeding section consists of at least one section, compartment or the like by way of a shaped area (45) delimited by a depression and/or raised portion (21, 21').
19. The device according to one of claims 17 and 18, characterised in that the number of feeding sections is equal to a multiple of the number of the bridging elements (9) of the outer cylinder (8) configured as paddles and/or vanes (10).

CERTIFICATION OF TRANSLATION

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I, Jane Holmes, c/o Technical Translation Agency GmbH,
Försterweg 33, A-2136 Laa/Thaya, Austria,
am the translator of the documents attached and certify that
the following is a true translation to the best of my knowledge
and belief.

Signature of translator

dated this 19th day of May 2006

Jane Holmes